

## FREQUENCY OF FOOD PURCHASE OF FAMILIES IN THREE DISTRICTS OF ANDHRA PRADESH IN THREE TIME PERIODS OF COVID – 19 PANDEMIC (BEFORE, DURING COVID – 19 PANDEMIC AND IN PRESENT SITUATION)

### Abstract

**Aim:**The study was under taken to know the frequency of food purchase of families in three districts of Andhra Pradesh in all three time periods OF COVID 19 PANDEMIC, i.e, before pandemic, during pandemic and in present situation.

**Study design:**Ex Post facto research design was adopted for the study

**Methodology:**The study comprised of 360 sample of families covering both urban and rural areas of three districts of Andhra Pradesh in all three time periods (before, during COVID – 19 pandemic and in present situation). Frequency of food purchase was used to assess whether there was any change in purchasing pattern in all three time periods among families of three districts of Andhra Pradesh. About 21 food groups were selected to assess purchasing pattern of families those are Cereals, Millets, Pulses, Fresh fruits, Green leafy Vegetables, Other vegetables, Milk and milk products, Chicken, Meat, Egg, Fish and other sea food, Oils, Sugars, Nuts, Spices, Dry fruits, Ready to eat foods, Baked products, Sweets and Savouries, Beverages, Coffee and Tea. The frequency of purchasing food groups was studied on daily basis, on weekly basis, on monthly basis, on yearly basis and whenever required.

**Results:**The results acquired for food purchasing pattern of families showed that milk and milk products were bought on daily basis by majority of families.

Foods that were purchased on weekly basis by majority of families included fruits (75 to 76 per cent), green leafy vegetables(84 to 85 per cent), other vegetables(86 to 88 per cent) and chicken(72 to 74 per cent).

Foods that were purchased on monthly basis by majority of families included cereals (99 per cent), millets(63 to 68 per cent), pulses(98 to 99 per cent), meat (48 to 49 per cent), eggs (73 to 74 per cent), fish (62 to 63 per cent), oils (98 per cent), sugars(95 to 96 per cent), nuts (95 per cent), spices (96 per cent), dry fruits(66 to 68 per cent), ready to eat foods (33 per cent), baked foods (63 per cent), sweets and savories (64 to 65 per cent), beverages (50 per cent), coffee powder (74 to 75 per cent) and tea powder (80 per cent).

Foods that were purchased on yearly basis by few families included millets, pulses, oils, sugars and spices (0.27 to 3 per cent).

**Comment [A1]:** The abstract has not been written according to the provisions in the template. This does not yet explain how the research objectives were achieved systematically. The twenty-one types of food do not have to be mentioned in this section (these would be better included in the body of the manuscript). Meanwhile, the frequency of food purchases in the three districts and three time periods is not answered in the conclusion. The length of the abstract exceeds the 300 word requirement.

Foods that were purchased whenever required by few families included millets, fruits, meat, eggs, fish, oils, sugars, spices, ready to eat foods, baked products, sweets and savouries, beverages, coffee powder and tea powder (43 per cent to 0.27 per cent).

**Conclusion:**In conclusion it was stated that based on peoples affordability status, their needs, their convenience and due to restricted timings in pandemic period frequency of food purchase varied from daily basis to whenever required.

**Key Words:** Frequency of food purchase, COVID – 19 pandemic, Food groups

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## **1 INTRODUCTION:**

Food habits and choices in India are changing due to food markets, urbanization, growth in food prices, uncertainty in food production and unequal distribution during the past decade.(1-4) This leads to either food insecurity or obesity in people. About 35% of the Indian population are underweight, while the overweight/obesity is estimated about 13% for women and 10% for men.(5) Foods shopping is directly associated with the income in both urban and rural areas(6) Householders reduced their foods shopping by 0.8% for every 1% increase in food prices.(7) Changes in householders shopping are shifting from food to other items in both urban and rural areas.(8)

In India women are more involved in decisions related to food shopping even though their involvement in decision making is low in financial management.(9) Women are considered to be part of theirfamily's prestige.(10) More than 70% of women take individual decision about the 'items to be cooked' in their homes.(11,12).A woman is generally perceived as the "queen of kitchen", in taking the decisions about the items to be cooked for their husbands or other family members.(13) In addition to this whether in nuclear or joint families women eat after males and children.(14) This attitude is more under conditions of poverty and during limited access to resources. (15,16,17)

COVID-19 pandemic has moresocial impact that lead to problematic activities in everyday life mainly related to food shopping. Lockdown, unemployment, and interruption in food supply chains had impact on consumer food availability and food security world wide (18). The World Food Program (WFP) estimates that people experiencing food crises due to the pandemic doubles around the world (19); however, the pandemic's impact on world wide food security is considered from issues related to customer food access rather than food availability (20). India, South Africa, and the United Kingdom were observed to have had

**Comment [A2]:** It has not provided a factual background, clearly defined problem, proposed solution, a brief literature survey and the scope and justification of the work done.

sharp decreases in-person grocery shopping during the beginning of the pandemic, potentially a result of these countries' strict and sudden lockdown implementations (21), and the world wide use of ordering online or by phone have increased dramatically during the pandemic (22, 23).

## 2 METHODOLOGY

Ex Post facto research design was adopted for the study

**2.1 Population and Sampling** Three districts selected for this study were Krishna, Vishakhapatnam and Chittoor districts of Andhra Pradesh. Stratified Random Sampling Method was used to select the study area. The mandals of these three districts were divided into urban and rural mandals. Twelve mandals – 6 urban mandals and 6 rural mandals were randomly selected. 360 sample of families comprising of 1231 family members were selected for this study. In 1231 family members they were 406 males and 825 females. Among them 31 males and 59 females were adolescents and rest of them were elderly.

Consent of the families was taken for participation in the study by explaining the aim of the study. The research study was presented to the Institutional Human Ethics Committee (IHEC) of the university before taking up the study at the field level, and the approval was taken.

### 2.2 Nature of Data

Quantitative data was used in this study.

### 2.3 Tools for Data Collection

Food purchasing pattern was measured using the Food purchasing questionnaire which is a structured questionnaire developed by individual for research purpose. The food purchasing questionnaire consisted of 21 food groups namely cereals, millets, pulses, fresh fruits, green leafy vegetables, other vegetables, milk and milk products, chicken, meat, egg, fish and other sea food, oils, sugars, nuts, spices, dry fruits, ready to eat foods, baked products, sweets and savouries, beverages, coffee and tea. In each table time period of purchase was mentioned. Each food group is compared from before pandemic situation to present situation. The codes were represented for time period of purchase and source of purchase were as follows:

List 1 : Code for Time period of purchase

**Comment [A3]:** There is no justification for why the research locations were determined in these three areas. Do the three regions have differences or similarities so they will be compared? Or are they selected and assumed to be a generalization of Andhra Pradesh? Who the population in the study is has not been explained because it is immediately stated that there are 360 household samples which are then stated to consist of 406 men and 825 women. Is this research actually related to gender or region? This is confusing. Why also use correlation, this study is not related to the relationship between variables? To compare frequencies, chi square or cluster analysis is usually used as in similar studies. How to compare the purchase frequency of 21 types of food between 3 regions and 3 time periods is not explained.

Time period of purchase	Code
Daily	1
Weekly	2
Monthly	3
Yearly	4
Whenever required	5

## 2.4 Statistical analysis

Percentages and Correlation were used to calculate the frequency of food purchase of selected families in all three time periods in three districts of Andhra Pradesh. These statistical tools were used to see the significant differences in food purchasing patterns of selected families in all three time periods in three districts of Andhra Pradesh.

## 3 RESULTS AND DISCUSSION

### 3.1 Distribution of families based on food purchasing pattern of the families before, during pandemic and in present situation

Respondents were individually distributed according to their frequency of purchase of foods in their families under daily, weekly, monthly, yearly and whenever required in Table 1.

**Table 1 Distribution of families based on food purchasing pattern of the families before, during pandemic and at present**

S.No	Foods	Time period	Frequency of Purchase				
			Daily (%)	Weekly (%)	Monthly (%)	Yearly (%)	Whenever Required (%)
1	Cereals	Before pandemic	0	2 (0.55)	358 (99.44)	0	0
		During pandemic	0	2 (0.55)	358 (99.44)	0	0
		Present	0	2 (0.55)	358 (99.44)	0	0
2	Millets	Before	0	0	227 (63.05)	1	1

**Comment [A4]:** The purchasing patterns of 21 types of food were not compared according to the 3 regions, even though in the title and research objectives, these 3 regions were mentioned explicitly. If it is not analyzed, it is better to just mention the wider area. However, it is necessary to consider whether these 3 districts are representative of the wider region (Andhra Pradesh).

		pandemic				(0.27)	(0.27)
		During pandemic	0	0	245 (68.05)	1 (0.27)	2 (0.55)
		Present	0	0	230 (63.8)	1 (0.27)	2 (0.55)
3	Pulses	Before pandemic	0	1 (0.27)	356 (98.88)	3 (0.83)	0
		During pandemic	0	1 (0.27)	357 (99.16)	2 (0.55)	0
		Present	0	1 (0.27)	357 (99.16)	2 (0.55)	0
4	Fruits	Before pandemic	1 (0.27)	274 (76.11)	56 (15.55)	0	4 (1.11)
		During pandemic	1 (0.27)	274 (76.11)	56 (15.55)	0	4 (1.11)
		Present	1 (0.27)	273 (75.83)	57 (15.83)	0	4 (1.11)
5	Green leafy vegetables	Before pandemic	4 (1.11)	304 (84.44)	18 (5)	0	0
		During pandemic	4 (1.11)	306 (85)	17 (4.72)	0	0
		Present	4 (1.11)	306 (85)	17 (4.72)	0	0
6	Other vegetables	Before pandemic	9 (2.5)	314 (87.22)	37 (10.27)	0	0
		During pandemic	5 (1.38)	318 (88.33)	37 (10.27)	0	0
		Present	9 (2.5)	313 (86.94)	38 (10.55)	0	0
7	Milk and milk products	Before pandemic	347 (96.38)	2 (0.55)	3 (0.83)	0	0
		During pandemic	346 (96.11)	2 (0.55)	3 (0.83)	0	0
		Present	344 (95.55)	2 (0.55)	3 (0.83)	0	0
8	Chicken	Before	0	269	23	0	0

		pandemic		(74.72)	(6.38)		
		During pandemic	0	262 (72.77)	29 (8.05)	0	0
		Present	0	264 (73.33)	29 (8.05)	0	0
9	Meat	Before pandemic	0	26 (7.22)	178 (49.44)	0	4 (1.11)
		During pandemic	0	28 (7.77)	176 (48.88)	0	4 (1.11)
		Present	0	28 (7.77)	178 (49.44)	0	3 (0.83)
10	Egg	Before pandemic	2 (0.55)	49 (13.6)	265 (73.6)	0	4 (1.11)
		During pandemic	1 (0.27)	50 (13.8)	266 (73.8)	0	3 (0.83)
		Present	1 (0.27)	49 (13.61)	268 (74.44)	0	3 (0.83)
11	Fish and other sea foods	Before pandemic	0	28 (7.77)	226 (62.77)	0	2 (0.55)
		During pandemic	0	28 (7.77)	228 (63.33)	0	2 (0.55)
		Present	0	28 (7.77)	228 (63.33)	0	2 (0.55)
12	Oils	Before pandemic	0	4 (1.11)	354 (98.33)	1 (0.27)	1 (0.27)
		During pandemic	0	3 (0.83)	355 (98.61)	1 (0.27)	1 (0.27)
		Present	0	3 (0.83)	356 (98.88)	1 (0.27)	0
13	Sugars	Before pandemic	0	6 (1.66)	348 (96.66)	0	1 (0.27)
		During pandemic	0	6 (1.66)	347 (96.38)	1 (0.27)	0
		Present	0	5 (1.38)	345 (95.83)	1 (0.27)	0
14	Nuts	Before	0	0	344 (95.55)	0	0

		pandemic					
		During pandemic	0	0	344 (95.55)	0	0
		Present	0	0	344 (95.55)	0	0
15	Spices	Before pandemic	0	0	347 (96.38)	12 (3.33)	1 (0.27)
		During pandemic	0	0	347 (96.38)	12 (3.33)	1 (0.27)
		Present	0	0	347 (96.38)	12 (3.33)	1 (0.27)
16	Dry fruits	Before pandemic	0	0	238 (66.11)	0	0
		During pandemic	0	0	247 (68.61)	0	0
		Present	0	0	242 (67.22)	0	0
17	Ready to eat foods	Before pandemic	1 (0.27)	31 (8.61)	121 (33.61)	0	6 (1.66)
		During pandemic	1 (0.27)	30 (8.33)	121 (33.61)	0	6 (1.66)
		Present	1 (0.27)	31 (8.61)	122 (33.88)	0	6 (1.66)
18	Baked products	Before pandemic	4 (1.11)	32 (8.88)	229 (63.61)	0	12 (3.33)
		During pandemic	4 (1.11)	32 (8.88)	229 (63.61)	0	12 (3.33)
		Present	4 (1.11)	33 (9.16)	229 (63.61)	0	12 (3.33)
19	Sweets and Savouries	Before pandemic	0	7 (1.94)	235 (65.27)	0	11 (3.05)
		During pandemic	0	8 (2.22)	232 (64.44)	0	11 (3.05)
		Present	0	7 (1.94)	233 (64.72)	0	11 (3.05)
20	Beverages	Before pandemic	1 (0.27)	20 (5.55)	182 (50.55)	0	7 (1.94)

		pandemic					
		During pandemic	1 (0.27)	19 (5.27)	181 (50.27)	0	7 (1.94)
		Present	1 (0.27)	18 (5)	182 (50.55)	0	7 (1.94)
21	Coffee	Before pandemic	0	2 (0.55)	272 (75.55)	0	1 (0.27)
		During pandemic	0	2 (0.55)	271 (75.27)	0	1 (0.27)
		Present	0	2 (0.55)	268 (74.44)	0	1 (0.27)
22	Tea	Before pandemic	0	0	291 (80.83)	0	1 (0.27)
		During pandemic	0	0	290 (80.55)	0	1 (0.27)
		Present	0	0	288 (80)	0	1 (0.27)

Out of 360 respondents the data obtained for food purchasing pattern of families showed that milk and milk products were bought on daily basis by majority of families. Fresh fruits, green leafy vegetables, vegetables, eggs, ready to eat foods, baked foods and beverages were purchased by few families (0.27 to 1.38 per cent) on daily basis.

Foods that were purchased on weekly basis by majority of families included fruits (75 to 76 per cent), green leafy vegetables(84 to 85 per cent), other vegetables(86 to 88 per cent) and chicken(72 to 74 per cent). Other food groups like cereals, pulses, milk, meat, eggs, fish, oils, sugars, ready to eat foods, baked products, sweets and savouries, beverages and coffee powder were bought on weekly basis by few families (0.27 to 9 per cent).

Foods that were purchased on monthly basis by majority of families included cereals (99 per cent), millets(63 to 68 per cent), pulses(98 to 99 per cent), meat (48 to 49 per cent), eggs (73 to 74 per cent), fish (62 to 63 per cent), oils (98 per cent), sugars(95 to 96 per cent), nuts (95 per cent), spices (96 per cent), dry fruits(66 to 68 per cent), ready to eat foods (33 per cent), baked foods (63 per cent), sweets and savories (64 to 65 per cent), beverages (50 per cent), coffee powder (74 to 75 per cent) and tea powder (80 per cent). Other food groups like fresh fruits, green leafy vegetables, vegetables, milk, chicken were bought on monthly basis by few families (0.83 to 15 per cent).

Foods that were purchased on yearly basis by few families included millets, pulses, oils, sugars and spices (0.27 to 3 per cent).

Foods that were purchased whenever required by few families included millets, fruits, meat, eggs, fish, oils, sugars, spices, ready to eat foods, baked products, sweets and savouries, beverages, coffee powder and tea powder (43 per cent to 0.27 per cent).

**Table 2 Correlation for frequency of purchasing pattern**

S.No			Correlations		
			Before	During	Present
1	Before	Pearson Correlation	1	.998**	1.000**
2	During	Pearson Correlation	.998**	1	.999**
3	Present	Pearson Correlation	1.000**	.999**	1

\*\* Correlation was significant at the 0.01 level

**Comment [A5]:** I don't understand which correlation analysis is intended to be used to achieve research objectives because it is not stated clearly in the methodology. Which and how relationships between purchasing patterns can be tested? Make explanations coherent and systematic so that they are easier to understand.

After comparison of three time periods the results analyzed presents statistically significantly correlated difference of purchasing pattern of millets. Non significantly correlated food groups observed like pulses, fresh fruits, green leafy vegetables, vegetables, milk and milk products, chicken, meat, eggs, fish, sugars, dry fruits, sweets and savories, coffee powder, during the 3 time periods.

Litton *et al.* (2021) explained among the 484 survey respondents, 36.2% were classified as food-insecure. Food-insecure respondents (17%) reduced their purchase of fresh fruit and vegetable, reasons included poor quality, poor availability, high price, reduced store trips, and concerns of contamination when compared to previous month.

Li *et al.* (2021) reported that covid-19 pandemic poses a threat to global food security, and it changes consumers' food buying and consumption behavior. Investigates trends in Spanish consumers' general food shopping and consumption habits during the lockdown, but also investigates these trends from the perspective of sustainable purchasing. Specifically, total food consumption (C), food expenditure (E), and purchase of food with sustainable attributes (S) were measured. Data collected was from a semi-structured questionnaire distributed online among 1203 participants. The logit models showed that gender, age, employment status, and consumers' experiences were associated with total food consumption and expenditure during the lockdown. In addition, consumers' risk perceptions, shopping places,

trust level in information sources, and risk preference were highly essential factors influencing consumers' preferences and sustainable behavior. Consumers' objective knowledge regarding COVID-19 was related to expenditure. Furthermore, family structure only affected expenditure, while income and place of residence influenced food consumption. Mood was associated with expenditure and the purchase of sustainable food. Household size affected purchasing behavior towards food with sustainable attributes.

Muresan *et al.* (2022) collected from Roman households using an online administrated questionnaire. The 784 questionnaires were analyzed by using descriptive statistics and Cluster analysis. Food shopping habits by consumers become more sustainable during the pandemic. The amount of the food loss was decreased and people found ways. The Cluster analysis of 25 food waste behavior factors were wasters ( $n = 264$ ), careless consumers ( $n = 227$ ), careful consumers ( $n = 359$ ). While the wasters chose to plan the shopping and the food menu for the next period, were males with a low level of education, while the careless consumers did not plan before going to shopping, as they discharge lower quantities of food compared with the first group and the careful consumers proved to be the most organized they preoccupied about the menu planning and reuse of leftovers. People were careful about their shopping habits, however, majority did not improve their habits.

Pradhan *et al.* (2013) explained that 20 householders were randomly selected from the Center for Cardio-metabolic Risk Reduction in South Asia (CARRS) surveillance study. Data were derived from 20 questionnaires. Half of the households spent at least two-thirds of their income on food. The major expenditures were on vegetables (22% of total food expenditure), milk and milk products (16%), and cereal and related products (15%). Income, food prices, food preferences and seasonal variation influenced food expenditure.

were personally surveyed with a structured questionnaire. These householders are spread across Aliet *et al.* (2010) studied a total of one hundred and one householders had adequate purchasing power were surveyed with a structured questionnaire. These householders were spread among the well-developed Gomtinagar region of Lucknow city. Simple statistical analysis like descriptive statistics, frequency distribution, cross tabulation, variance and factorial analysis were carried out. Most of the food and grocery items were purchased in loose forms from the near stores. Fruits and vegetables were purchased daily or weekly twice as they were perishable, whereas grocery items were less frequently purchased.

Yoo *et al.* (2006) reported that food shopping patterns range between a weekly trip with a some small trips (34.9%), twice weekly large trips with a some small trips (21.9%), there

were no large purchasing trips (15.4%), a weekly large trip without small trips (13.9%), a monthly large trip (8.3%), and biweekly large trips without small trips (6.4%).

Ricciuto *et al.* (2006) reported data from the 1996 Family Food Expenditure survey was conducted ( $n=10\,924$ ). Householders food purchases were divided into one of the five food groups from Canada's Food Guide to Healthy Eating. Parametric and non-parametric modelling techniques were used to analyse the effects of householders family size, income and education on income spent on each food group and the quantity purchased from each food group. Householders family size, income and education all were explained 21–29% of the variation in food purchasing. Householders with older adults spend a great income on vegetables and fresh fruit ( $P<0.0001$ ), whereas householders with children purchased greater amounts of milk products ( $P<0.0001$ ). Higher income householders purchased more of all food groups ( $P<0.0001$ ), but the associations were nonlinear, with the strongest effects on lower income groups. Householders who had a university degree purchased significantly more vegetables and fruit, and less meat and other foods ( $P<0.0001$ ), relative to householders with the low education level. Household socio-demographic characteristics have a strong impact on food purchase, with the purchase of vegetables and fruits were particularly sensitive.

#### 4 CONCLUSION

In conclusion it can be stated that based on peoples affordability status, their needs, their convenience and due to restricted timings in pandemic period frequency of food purchase varied from daily basis to whenever required. However the study showed no significant difference in purchasing frequency of food items but change is observed in quantity of food purchase.

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**Comment [A6]:** The conclusion does not indicate the achievement of the research objectives. Please readjust it so that this manuscript shows a common thread starting from the background of the problem, objectives, methods, results and discussion, and conclusions. Thus, this manuscript will become a higher quality scientific work.

**Comment [A7]:** Check the writing of references again with the provisions in the template. Added up-to-date references from the AJAEEs.

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